

FOUR NEW SPECIES OF *CULMANA*, GYPONINAE (HOMOPTERA: CICADELLIDAE) FROM PERU AND BOLIVIA¹

Dwight M. DeLong²

ABSTRACT: Four New Species of *Culmana* – Gyponinae – from Peru and Bolivia, *C. concava* n.sp., *C. dualana* n.sp., *C. bacula* n.sp., and *C. spinella* n.sp., are described.

The genus *Culmana* was described (1972) by DeLong and Freytag, and *C. torqua* DeL. & Frey. was designated as the type. A synopsis of the genus was published (1972) in which eight species were treated, seven of which were described as new. Four new species are described at this time. The genus *Culmana* is related to *Polana* and *Scaris*.

Culmana concava n.sp.

(Figs. 1-5)

Length of male 10 mm, female unknown. Crown two and one-half times as wide at base between eyes as median length. Color, crown brown with a round black spot behind each ocellus at base. Pronotum brown, a series of faint darker brown spots along anterior margin. Scutellum brown, basal angles darker brown. Forewings dark brown, three small black spots on clavus along commissure and two on corium.

Male genital plates two and one-half times median width, apices narrow, rounded. Style with blade shallowly concavely rounded on ventral margin near base, apical fifth curved dorsally, apex blunt, rounded. Aedegal shaft bearing two short, lateral, subapical spines at five-sixths length of shaft. Apex with three spines, a median and two lateral, which curve dorsally. Pygofer bluntly pointed apically, with a plate beneath pygofer wall, each side, which is rounded apically and does not extend to apex of pygofer.

Holotype male, Santa Isabel, Dept. Cusco, Peru XII-10-1952, Felix L. Waytkowski coll., in the North Carolina State University collection.

C. concava is related to *lucida*.

Culmana dualana n.sp.

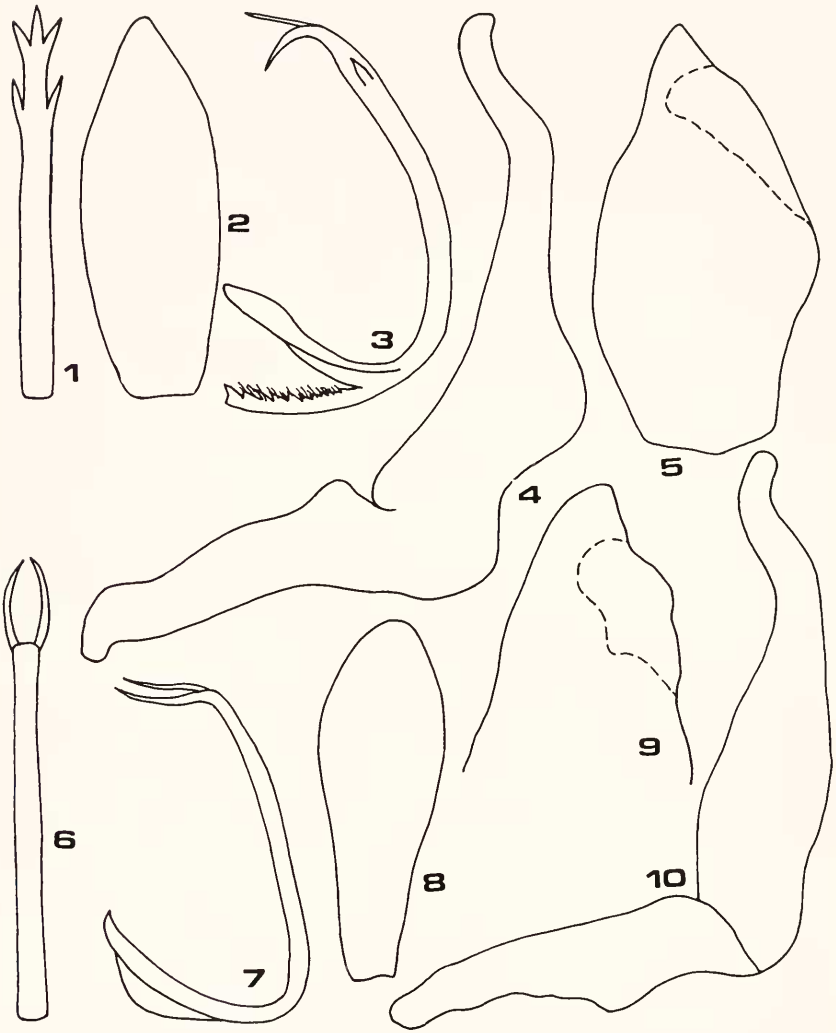
(Figs. 6-10)

Length of male 10.3 mm, female unknown. Crown two and one-half times as broad at base between eyes as median length. Color, dark brown anteriorly, light brown posteriorly, with a small round black spot behind each ocellus at base. Pronotum dark brown. Scutellum pale brown, with dark brown basal angles. Forewings dark brown with two very small black spots on clavus along commissure, three larger spots on corium.

Male genital plates narrow on basal third, three times as long as median width, apices

¹Received December 11, 1978

²Department of Entomology, Ohio State University.



Figs. 1-5 *Culmana concava* n.sp. 1, aedeagus ventrally, 2, plate ventrally, 3, aedeagus laterally, 4, style laterally, 5, pygofer laterally. Figs. 6-10 *C. dualana* n.sp. 6, aedeagus ventrally, 7, aedeagus laterally, 8, plate ventrally, 9, pygofer laterally, apical portion, 10, style laterally.

rounded. Style with blade broadly, concavely excavated on ventral margin at two-thirds its length; apical eighth curved dorsally, apex blunt, rounded. Aedeagal shaft slender, bearing a pair of slender, apical, pincer-like processes, one-fifth length of shaft, extending caudally. Pygofer narrowed apically, bluntly rounded, bearing a plate beneath pygofer wall, each side, which is rounded apically and does not extend to apex of pygofer.

Holotype, male, Santa Isabel, Dept. Cusco, Peru, XII-1-1952, Felix L. Waytkowski coll., in the North Carolina State University collection.

C. dualana is related to *turba*.

Culmana bacula n.sp.

(Figs. 11-15)

Length of male 10.5 mm, female unknown. Crown three times as wide between eyes at base as median length. Color, anterior margin of crown cream colored, bordered with black above. Median portion of crown brown with black median line and a round black spot behind each ocellus, at base. Pronotum with two proximal round black spots near anterior margin. A large black area, with white center, on anterior portion of pronotum behind inner margin of each eye. Disc and posterior portion of pronotum brown. Scutellum dark brown with four white spots, equidistant, across anterior margin, and one on margin at middle, each side. Forewings dark brown with two black spots on clavus and three on corium.

Male genital plates two and one-half times as long as median width, apex narrowed, rounded. Style with a rounded notch on ventral margin of basal third of blade. Blade slightly enlarged at two-thirds its length by a rounded bulge on ventral margin, apex narrow, rounded. Aedeagal shaft with apex roundly notched, forming two short apical spines. Enlarged portion just basad of notch with two prominent spines, each side. A process arises on ventral margin, subapically and extends almost to apex of apical processes. Pygofer with a rod-like process arising beneath pygofer wall and extending beyond apex of pygofer. Apex of process blunt.

Holotype male, Machu Picchu, Peru XI-25-67, D.M. DeLong coll., in the DeLong collection.

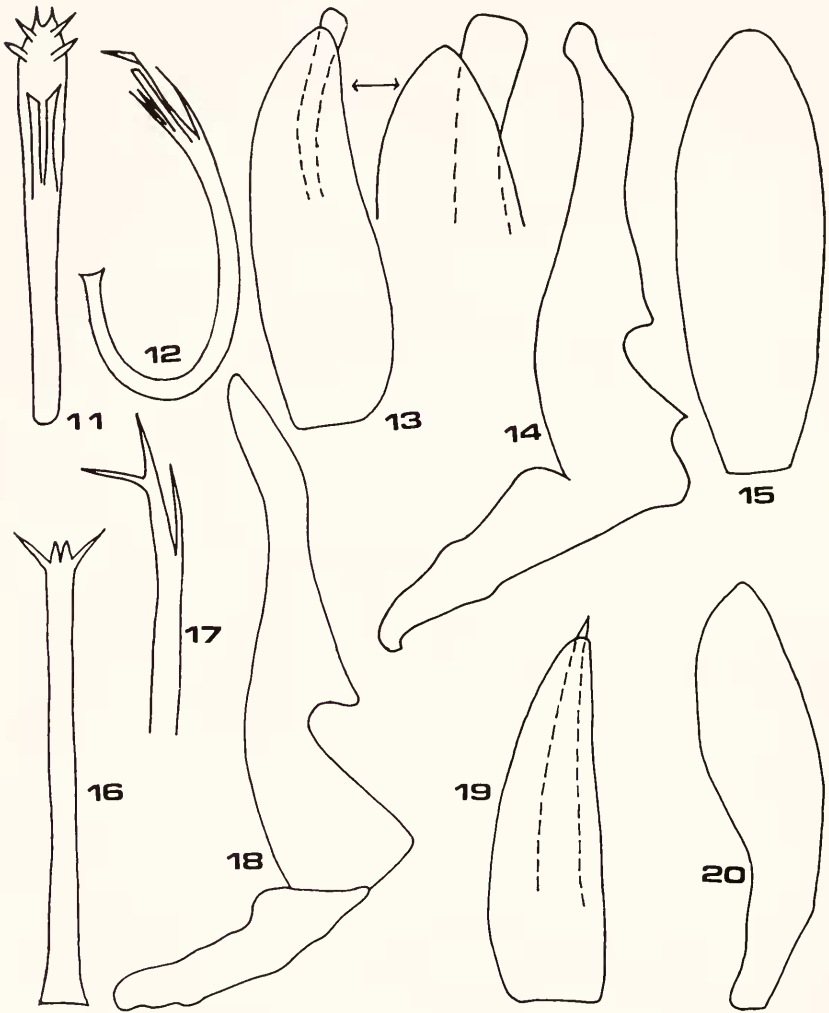
C. bacula is related to *fascia* and *excava*.

Culmana spinella n.sp.

(Figs. 16-20)

Length of male 10.5 mm, female unknown. Crown two and one-half times as wide at base between eyes as median length. Color, anterior margin of crown pale brown, median black line and a round black spot behind each ocellus, at base. Pronotum mostly dark brown with black and white irregular coloration. Two small proximal black spots near anterior margin. White areas behind each eye. Scutellum dark brown with a white spot at middle, each side. Forewings brown with black spots on corium and two on clavus along commissure.

Male genital plates elongate, slender at base, four times as long as median width, apices narrow, rounded. Style with blade deeply roundly excavated on ventral margin at one-third length of blade, bent slightly, dorsally, subapically, apex narrow, rounded. Aedeagal shaft bearing a pair of short, proximal, median teeth and a spine about one-eighth length of shaft extending laterocaudally, each side. Pygofer pointed at apex, with a slender plate-like process on inner pygofer wall. Process pointed at apex extending



Figs. 11-15 *C. bacula* n.sp. 11. aedeagus ventrally, 12, aedeagus laterally, 13. pygofer laterally 14. style laterally, 15. plate ventrally, Figs. 16-20 *C. spinella* n.sp. 16. aedeagus ventrally, 17. aedeagus laterally, apical portion, 18. style laterally, 19. pygofer laterally, 20. plate ventrally.

slightly beyond apex of pygofer.

Holotype male, Uenlagarde le Paz, Bolivia, in the U.S. National Museum.

C. spinella is related to *excava*.

LITERATURE CITED

DeLong, Dwight M. and Paul H. Freytag. 1972. Studies of the Gyponinae. A key to the known genera and descriptions of five new genera. Jour. Kans. Entomol. Soc. 45: 405-413.

_____. 1972. Studies of the Gyponinae: The genus *Culmana* and seven new species (Homoptera:Cicadellidae). Jour. Kans. Entomol. Soc. 45:405-413.

DEFLECTION DISPLAY OF GRAY HAIRSTREAK BUTTERFLY¹

Hervey Brackbill²

A predator-deflection display that I believe has not been reported before for this butterfly was given by a Gray Hairstreak (*Strymon melinus* Hübner) at Woodlawn, Baltimore Co., Md., on 29 August 1978. The insect flew onto a petunia plant in a flower box. When I went close I found it settled with body vertical but head downward; with the wings closed above its back, the tails of the hindwings thus stuck up like antennae. This, along with the eyelike appearance of the black-centered orange spot on the adjacent wing edge, made what was actually the rear of the insect resemble the head. Soon I became aware that the butterfly was enhancing this appearance by making the false antennae wave, which it did by "shuffling" its still closed hindwings—moving one forward slightly, the other backward slightly. This it continued until, shortly, it flew away.

Wickler (*Mimicry in Plants and Animals*, McGraw-Hill, N.Y., 1968:75) notes the form and coloration of this butterfly but says nothing of its behavior. He and Cott (*Adaptive Coloration in Animals*, Oxford Univ. Press, N.Y., 1940:372) both report this behavior in some species of the related *Thecla*. Hailman (*Optical Signals*, Indiana Univ. Press, Bloomington and London, 1977:182) recently predicted that it would be found in hairstreaks.

¹Received for publication: November 6, 1978

²2620 Poplar Drive, Baltimore, Md., 21207.